United States
Environmental Protection Agency

Air and Radiation
Stratospheric Protection Division
6205J

# Substitute Aerosols Under SNAP as of June 8, 1999

**SNAP Information: http://www.epa.gov/ozone/title6/snap/snap.html**
**Stratospheric Ozone Protection Hotline: (800) 296-1996**

EPA has created the Significant New Alternatives Policy (SNAP) Program under section 612 of the Clean Air Act Amendments. SNAP evaluates alternatives to ozone-depleting substances. Substitutes are reviewed on the basis of ozone depletion potential, global warming potential, toxicity, flammability, and exposure potential as described in the March 18, 1994 final SNAP rule (59 FR 13044). Lists of acceptable and unacceptable substitutes will be updated periodically in the Federal Register. The following SNAP notices and subsequent final rules are included in this list: August 26, 1994 (59 FR 44240), January 13, 1995 (60 FR 3318), June 13, 1995 (60 FR 31092), July 28, 1995 (60 FR 38729), February 8, 1996 (61 FR 4736), May 22, 1996 (61 FR 25585), September 5, 1996 (61 FR 47012), October 16, 1996 (61 FR 54030), March 10, 1997 (62 FR 10700), June 3, 1997 (62 FR 30275) , February 24, 1998 (63 FR 9151), May 22, 1998 (63 FR 28251), January 26, 1999 (64 FR 3861), April 28, 1999 (64 FR 22981), and June 8, 1999 (64 FR 30410).

## Acceptable Substitutes for Aerosol Propellants Under the Significant New Alternatives Policy (SNAP) Program as of June 8, 1999

| Substitute | ODS Being Replaced | Comments |
|---|---|---|
| Saturated light hydrocarbons, C3-C6 (e.g., propane, isobutane, n-butane) | CFC-11, HCFC-22, HCFC-142b | Hydrocarbons are flammable materials. Use with the necessary precautions. |
| Dimethyl ether | CFC-11, HCFC-22, HCFC-142b | DME is flammable. Use with the necessary precautions. Blends of DME with HCFCs are subject to section 610 restrictions. |
| HFC-152a, HFC-134a, HFC-125 | CFC-11, HCFC-22, HCFC-142b | HFC-134a, HFC-125 and HFC-152a are potential greenhouse gases. |
| HFC-227ea | CFC-11, CFC-12, CFC-114, HCFC-22, HCFC-142b | Despite the relatively high global warming potential of this compound, the agency has listed this substitute as acceptable since it meets a specialized application in MDIs where other substitutes do not provide acceptable performance. |
| Alternative processes (pumps, mechanical pressure dispensers, non-spray dispensers) | CFC-11, HCFC-22, HCFC-142b | |
| Compressed Gases (carbon dioxide, air,nitrogen, nitrous oxide) | CFC-11, HCFC-22, HCFC-142b | |
| HCFC-22, HCFC-142b | CFC-11 | All aerosol propellant uses of HCFC-22 and HCFC-142b are already prohibited as of January 1, 1994, under Section 610(d) of the Clean Air Act. Only one exemption exists. It is described in the section on aerosol substitutes in 59 FR 13044. |

## Acceptable Substitutes for Aerosol Solvents under the Significant New Alternatives Policy (SNAP) Program as of June 8, 1999

| Substitute | ODS Being Replaced | Comments |
|---|---|---|
| C5-C20 Petroleum hydrocarbons | CFC-11, CFC-113, MCF, HCFC-141b | Petroleum hydrocarbons are flammable. Use with the necessary precautions. Pesticide aerosols must adhere to FIFRA standards. |
| Chlorinated solvents (trichloroethylene, perchloroethylene, methylene chloride) | CFC-11, CFC-113, MCF, HCFC-141b | Extensive regulations under other statutes govern use of these chemicals, including VOC standards, workplace standards, waste management standards, and pesticide formulation and handling standards. Should be used only for products where nonflammability is a critical feature. |
| Oxygenated organic solvents (esters, ethers, alcohols, ketones) | CFC-11, CFC-113, MCF, HCFC-141b | These substitutes are flammable. Use with the necessary precautions. |
| Terpenes | CFC-11, CFC-113, MCF, HCFC-141b | These substitutes are flammable. Use with the necessary precautions. |
| Water-based formulations | CFC-11, CFC-113, MCF, HCFC-141b | |
| Trans-1,2-dichloroethylene | CFC-11, CFC-113, MCF, HCFC-141b | The OSHA set exposure limit is 200 ppm. |
| HCFC-225ca/cb | CFC-113, MCF | Company-set time-weighted average workplace exposure limit of 25 ppm for the HCFC225 ca isomer. |
| HFC-4310mee | CFC-113, MCF, HCFC-141b | Company-set time-weighted average workplace exposure standard of 200 ppm, and a workplace exposure ceiling of 400 ppm. |
| Hydrofluoroether (HFE): $C_4F_9OCH_3$ (methoxynonafluorobutane, iso and normal) | CFC-11, CFC-113, MCF, HCFC-141b | |
| HCFC-141b and its blends | CFC-11, CFC-113, MCF | All aerosol solvent uses of HCFC-141b, either by itself or blended with other compounds, were prohibited as of January 1, 1994 under Section 610 (d) of the Clean Air Act. Limited exemptions exist, and are described in the section on aerosol substitutes in 59 FR 13044. |

## Substitutes for Aerosol Solvents Acceptable Subject to Use Conditions under the Significant New Alternatives Policy (SNAP) Program as of June 8, 1999

| Substitute | ODS Being Replaced | Conditions |
|---|---|---|
| Monochlorotoluene/ benzotrifluorides | CFC-11, CFC-113, MCF, HCFC-141b | Subject to a 50 ppm workplace standard for monochlorotoluenes and a 100 ppm standard for benzotrifluoride. |

| Substitutes for Aerosol Solvents Acceptable Subject to Narrowed Use Limits under the Significant New Alternatives Policy (SNAP) Program as of June 8, 1999 | | | |
|---|---|---|---|
| **Substitute** | **ODS Being Replaced** | **Limitations** | **Comments** |
| Perfluorocarbons | CFC-113, MCF, HCFC-141b | Acceptable only where reasonable efforts have been made to ascertain that other alternatives are not technically feasible due to performance or safety requirements. | PFCs have extremely long atmospheric lifetimes and high GWPs. This decision reflects these concerns and is patterned after the SNAP decision on PFCs in the solvent cleaning sector. |
| Perfluoropolyethers | CFC-113, MCF, HCFC-141b | Acceptable only where reasonable efforts have been made to ascertain that other alternatives are not technically feasible due to performance or safety requirements. | PFPEs have similar global warming profile to the PFCs, and the SNAP decision on PFPEs parallels that for PFCs in the solvent cleaning sector. |

| Unacceptable Substitutes for Aerosol Propellants under the Significant New Alternatives Policy (SNAP) Program as of June 8, 1999 | | |
|---|---|---|
| **Substitute** | **ODS Being Replaced** | **Reason** |
| $SF_6$ | CFC-11, CFC-12, HCFC-22, HCFC-142b | $SF_6$ has the highest GWP of all industrial gases, and other compressed gases meet user needs equally well. |

| Unacceptable Substitutes for Aerosol Solvents under the Significant New Alternatives Policy (SNAP) Program as of June 8, 1999 | | |
|---|---|---|
| **Substitute** | **ODS Being Replaced** | **Reason** |
| Chlorobromomethane | CFC-113, MCF, HCFC-141b | Other alternatives exist with zero or much lower ODP. |